

WHAT IS CLAIMED AS NEW AND IS INTENDED TO BE SECURED BY
LETTERS PATENT IS:

1. A process, which comprises:

contacting a first liquid comprising at least one hydrocarbon compound with a first oxidant in a first reactor and

contacting a second liquid comprising at least one hydrocarbon obtained from the first reactor with a second oxidant in a second reactor.

2. The process as claimed in claim 1,

wherein the second liquid is selected from the group consisting of a first effluent, a first light phase, and mixtures thereof;

wherein the first effluent is obtained from the first reactor and the first light phase is obtained from a first vessel.

3. The process as claimed in claim 1, further comprising:

contacting a liquid and an aqueous solution in a raffinate wash column to obtain an aqueous extract and a washed raffinate;

wherein the liquid comprises at least one of a second effluent obtained from the second reactor, a second light phase obtained from a second vessel, a first raffinate obtained from an extraction column, or mixtures thereof;

recovering a polar solvent from a crude polar solvent to obtain a recovered liquid;

wherein the crude polar solvent comprises at least one of a first extract obtained from an extraction column, a second heavy phase obtained from a second vessel, a first heavy phase obtained from a first vessel, or mixtures thereof; and

distilling hydrocarbons by heating the recovered liquid at a pressure less than about 1 bar absolute.

4. The process as claimed in claim 1, further comprising:

contacting a liquid and an aqueous solution in a raffinate wash column to obtain an aqueous extract and a washed raffinate;

wherein the liquid comprises at least one of a second effluent obtained from the second reactor, a second light phase obtained from a second vessel, a first raffinate obtained from an extraction column, or mixtures thereof;

recovering a polar solvent from a crude polar solvent to obtain a recovered liquid;

wherein the crude polar solvent comprises at least one of a first extract obtained from an extraction column, a second heavy phase obtained from a second vessel, a first heavy phase obtained from a first vessel, or mixtures thereof.

5. The process as claimed in claim 1, further comprising:

contacting an effluent obtained from the second reactor with a polar solvent in an extraction column to obtain a first raffinate and a first extract;

contacting a liquid comprising the first raffinate and an aqueous solution in a raffinate wash column to obtain an aqueous extract and a washed raffinate;

recovering a polar solvent from a crude polar solvent to obtain a recovered liquid;

wherein the crude polar solvent comprises at least one of a first extract obtained from an extraction column, a second heavy phase obtained from a second vessel, a first heavy phase obtained from a first vessel, or mixtures thereof.

distilling hydrocarbons by heating the recovered liquid at a pressure less than about 1 bar absolute.

6. The process as claimed in claim 1, further comprising:

contacting a liquid and an aqueous solution in a raffinate wash column to obtain an aqueous extract and a washed raffinate;

wherein the liquid comprises at least one of a second effluent obtained from the second reactor, a second light phase obtained from a second vessel, a first raffinate obtained from an extraction column, or mixtures thereof;

contacting the washed raffinate and an adsorbent material in a raffinate polishing system to obtain a product gas oil;

recovering a polar solvent from a crude polar solvent to obtain a recovered liquid;

wherein the crude polar solvent comprises at least one of a first extract obtained from an extraction column, a second heavy phase obtained from a second vessel, a first heavy phase obtained from a first vessel, or mixtures thereof; and

distilling hydrocarbons by heating the recovered liquid at a pressure less than about 1 bar absolute.

7. The process as claimed in claim 1, further comprising:

contacting an effluent obtained from the second reactor with a polar solvent in an extraction column to obtain a first raffinate and a first extract;

contacting a liquid comprising the first raffinate and an aqueous solution in a raffinate wash column to obtain an aqueous extract and a washed raffinate;

contacting the washed raffinate and an adsorbent material in a raffinate polishing system to obtain a product gas oil;

recovering a polar solvent from a crude polar solvent to obtain a recovered liquid;

wherein the crude polar solvent comprises at least one of a first extract obtained from an extraction column, a second heavy phase obtained from a second vessel, a first heavy phase obtained from a first vessel, or mixtures thereof.

distilling hydrocarbons by heating the recovered liquid at a pressure less than about 1 bar absolute.

8. The process as claimed in claim 1, further comprising:

transferring the second liquid comprising a first light phase and a first heavy phase obtained from the first reactor to a first vessel;

separating the first light phase and the first heavy phase in said first vessel;

transferring the first light phase to the second reactor;

transferring a second effluent comprising a second light phase and a second heavy phase obtained from the second reactor to a second vessel;

separating the second light phase and the second heavy phase in said second vessel;

transferring the second light phase to an extraction column;

contacting the second light phase with a polar solvent in an extraction column to obtain a first raffinate and a first extract;

contacting a liquid comprising the first raffinate and an aqueous solution in a raffinate wash column to obtain an aqueous extract and a washed raffinate;

contacting the washed raffinate and an adsorbent material in a raffinate polishing system to obtain a product gas oil;

recovering a polar solvent from a crude polar solvent to obtain a recovered liquid;

wherein the crude polar solvent comprises at least one of a first extract obtained from an extraction column, a second heavy phase obtained from a second vessel, a first heavy phase obtained from a first vessel, or mixtures thereof.

distilling hydrocarbons by heating the recovered liquid at a pressure less than about 1 bar absolute.

9. The process as claimed in claim 1, which further comprises:
contacting a third liquid obtained from the second reactor with a third oxidant in a third reactor.
10. The process as claimed in claim 9, wherein the third liquid is selected from the group consisting of a second effluent, a second light phase, and mixtures thereof;
wherein the second effluent is obtained from the second reactor; and
wherein the second light phase obtained from a second vessel.
11. The process as claimed in claim 1, wherein the first oxidant is selected from the group consisting of a second heavy phase, a third heavy phase, and mixtures thereof;
wherein the second heavy phase is obtained from a second vessel and the third heavy phase is obtained from a third vessel.
12. The process as claimed in any one of claims 2-11, which further comprises
maintaining a second or third light phase in at least one destruct reactor for a period of time to obtain at least one destruct reactor effluent.
13. The process as claimed in claim 1, wherein the first liquid comprises a crude gas oil.

14. The process as claimed in claim 1, wherein the first liquid comprises at least one hydrocarbon and at least one organosulfur compound.
15. The process as claimed in claim 1, wherein the first liquid comprises a distillate of crude oil.
16. The process as claimed in claim 1, wherein the first liquid comprises a middle distillate comprising hydrocarbons having boiling points that range from 65°C to 385°C.
17. The process as claimed in claim 1, wherein the first liquid comprises crude gas oil obtained by a hydrodesulfurizing process.
18. The process as claimed in claim 1, which further comprises hydrodesulfurizing a product gas oil obtained by said process.
19. The process as claimed in claim 1, wherein the concentration of the first oxidant fed to the first reactor is less than or equal to the concentration of the second oxidant fed to the second reactor.
20. The process as claimed in claim 1, wherein the first liquid comprises unoxidized organosulfur compounds and the concentration of the unoxidized organosulfur compounds in the first liquid is greater than the concentration of the unoxidized organosulfur compounds in the second liquid.

21. The process as claimed in claim 1, wherein the first liquid comprises unoxidized organosulfur compounds and the concentration of unoxidized organosulfur compounds in a first effluent obtained from the first reactor is greater than the concentration of the unoxidized organosulfur compounds in a second effluent obtained from the second reactor.

22. The process as claimed in claim 1, wherein the first liquid comprises unoxidized organo-nitrogen compounds and the concentration of unoxidized organo-nitrogen compounds in a first effluent obtained from the first reactor is greater than the concentration of unoxidized organo-nitrogen compounds in a second effluent obtained from the second reactor.

23. A process of reducing pollution comprising at least one oxidized sulfur compound, which comprises:

burning a product gas oil obtained by the process as claimed in claim 1.

24. A process of producing heat, which comprises:

burning a product gas oil obtained by the process as claimed in claim 1.

25. The process as claimed in claim 1, further comprising:

obtaining a product gas oil having a sulfur content less than 500 ppmw.

26. The process as claimed in claim 1, further comprising:

obtaining a product gas oil having a sulfur content that ranges from 15 ppmw to 500 ppmw.

27. The process as claimed in claim 1, further comprising:
obtaining a product gas oil having a sulfur content less than 15 ppmw.
28. The process as claimed in claim 1, further comprising:
obtaining a product gas oil having a sulfur content that ranges from about 1 ppmw to about 15 ppmw.
29. The process as claimed in claim 1, wherein the first liquid has a sulfur content of about 5 to 100,000 ppmw.
30. The process as claimed in claim 1, wherein the first liquid has a sulfur content of about 5 to 50,000 ppmw.
31. The process as claimed in claim 1, wherein the first liquid has a sulfur content of about 5 to 5,000 ppmw.
32. The process as claimed in claim 1, wherein the first liquid has a sulfur content of about 5 ppmw to about 500 ppmw.
33. The process as claimed in claim 1, wherein the first liquid has a sulfur content of about 5 ppmw to about 300 ppmw.
34. The process as claimed in claim 1, wherein the first liquid has a sulfur content of about 5 ppmw to about 100 ppmw.

35. The process as claimed in claim 1, wherein the first liquid has a sulfur content of about 5 ppmw to about 50 ppmw.

36. A process for stabilizing a product gas oil, which comprises:
storing the product gas oil obtained by the process as claimed in claim 1.

37. A multi-stage system, comprising:

- (a) an oxidation stage;
- (b) an extraction stage;
- (c) a raffinate washing stage;
- (d) a raffinate polishing stage;
- (e) a solvent recovery stage;
- (f) a solvent purification stage; and
- (g) a hydrocarbon recovery stage.

38. A process for reducing the concentration of organosulfur compounds in a liquid, which comprises:

treating at least one liquid comprising hydrocarbons with at least one of stage (a) – (g) as claimed in claim 37 to obtain a product gas oil.

39. A process of reducing pollution comprising at least one oxidized sulfur compound, which comprises:

burning the product gas oil obtained by the process as claimed in claim 38.

40. A process of producing heat, which comprises:
burning the product gas oil obtained by the process as claimed in claim 38.

41. A process for stabilizing a product gas oil, which comprises:
storing the product gas oil obtained by the process as claimed in claim 38.